

# CERES DATA MANAGEMENT TEAM WORKING GROUP REPORT

KATHLEEN D. MOORE

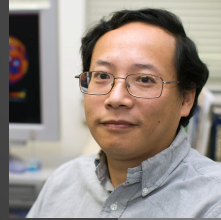
SEPTEMBER 26, 2017

# DMT ORGANIZATION – SUBSYSTEM STAFF



## Instrument

- Denise Cooper
- Thomas Grepiotis
- Dianne Snyder
- Mark Timcoe



## ERBE-like

- Dale Walikainen
- Jeremie Lande



## Clouds

- Sunny Sun-Mack
- Ricky Brown
- Yan Chen
- Liz Heckert
- Rita Smith

# DMT ORGANIZATION – SUBSYSTEM STAFF



## Inversion

- Victor Sothcott
- Igor Antropov



## SARB

- Tom Caldwell

# DMT ORGANIZATION – SUBSYSTEM STAFF



## TISA Gridding

- Josh Wilkins



## TISA Averaging

- Cathy Nguyen
- Ed Kizer

# DMT ORGANIZATION – SUBSYSTEM STAFF



## Systems/Optimization

Nelson Hillyer

## Production/Optimization

Carla Grune

## Task Manager

Walt Miller

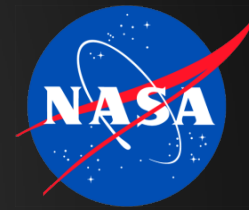
## Product Web Support

- Churngwei Chu
- Cristian Mitrescu

## Configuration Mgmt.

- Tammy Ayers
- Dennis Keyes
- Joanne Saunders

# DMT OVERALL TASKS



## Algorithms

- Implementation
- Verification
- Validation assistance

## Software

- Maintenance
- Configuration management

$$Z = \sum_{i=0}^n (\Delta C_i / \sigma C_i)^2 + \sum_{j=1}^m (\Delta v_j / \sigma v_j)^2 + \sum_{k=1}^l (\Delta F_k / \sigma F_k)^2 \quad (3)$$

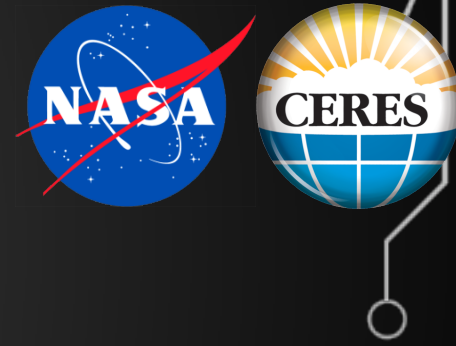
where on the r.h.s. the first term represents the cloud fraction adjustment for model variable adjustments, and the third term the flux component.

Equation (4) below restricts the solution such that the sum of the cloud fraction adjustments is zero. This prevents unrealistic solutions (i.e., sum of adjusted total fraction

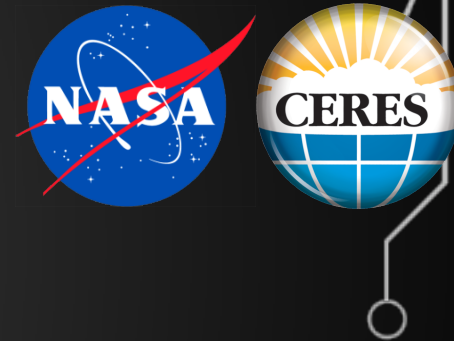
$$X = \sum_{i=0}^n \Delta C_i = 0 \quad (4)$$

```
if ( dato(i,1) == -1 .and. dat(i,1) > 0.0 .and. dat(i,1) < 10000 ) then
  if (ifill == 1) then
    qc_validflag_sahclim_global(i) = 1
  endif
  if (ifill == 2) then
    qc_validflag_epoch_global(i) = 1
  endif
  qc_validflag_all_global(i) = 1
  dato(i,1:np) = dat(i,1:np)
endif

if ( dato(i,1) == -1 .and. ifill .eq. 2 ) then !LAST RESORT IGBP Based
  igbp1 = igbp(i)
  u0ohs = 1.0
  wv = 1.0 ! Pw(cm)
  call land_spec(igbp1, u0ohs, wv, spec18_dum, bbalb)
  dato(i,1) = bbalb * 10000
  dato(i,2) = u0ohs * 1000
```



# RECENT DMT ACTIVITY

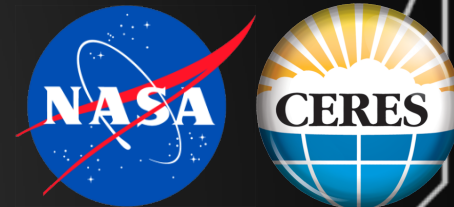


DELIVERIES SINCE 05/16/17:

10 DROPBOX/COEFFICIENT

28 CODE

38



# CODE DELIVERIES SINCE 05/16/17

## INSTRUMENT (4)

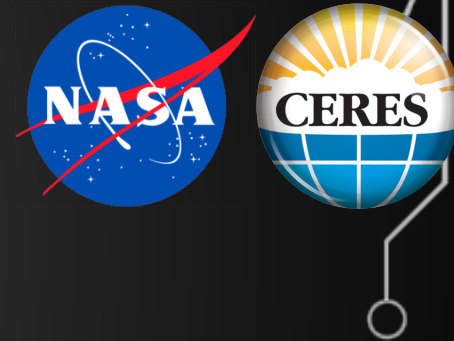
Gains (all instruments), FM6 code updates

## INVERSION (1)

Improve MATCH cc-code flexibility

## TISA GRIDDING (1)

Improve GEO satellite positional flexibility



# CODE DELIVERIES SINCE 05/16/17

## TISA AVERAGING (1)

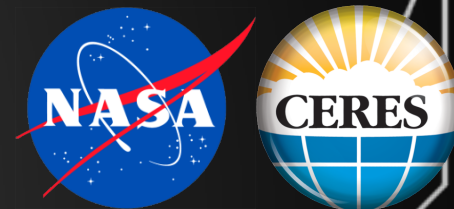
Updated Nb-to-Bb coefficient code and snow/ice directional models, temporal and spatial restrictions, Terra+S-NPP support

## CLOUDS (1)

MODIS C6.0 support

## ERBE-like (3)

Daily snow filename-format handling, SRFs



# CODE DELIVERIES SINCE 05/16/17

## CERESLib (1)

Updated GRing.f90 module

## CATALYST (9)

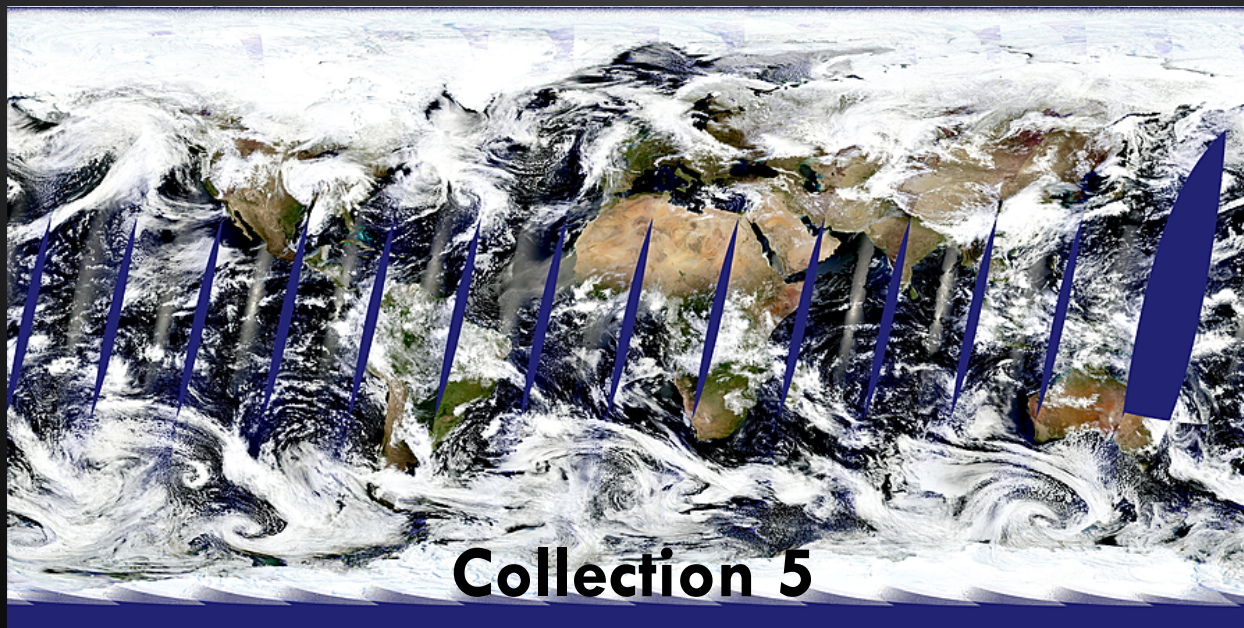
PGE automation support (TISA Avg, MODIS C6.0 support, Clouds/Inversion, FM6 testing, CldTypHist, Instrument, ERBE-like)

## PR TOOL (7)

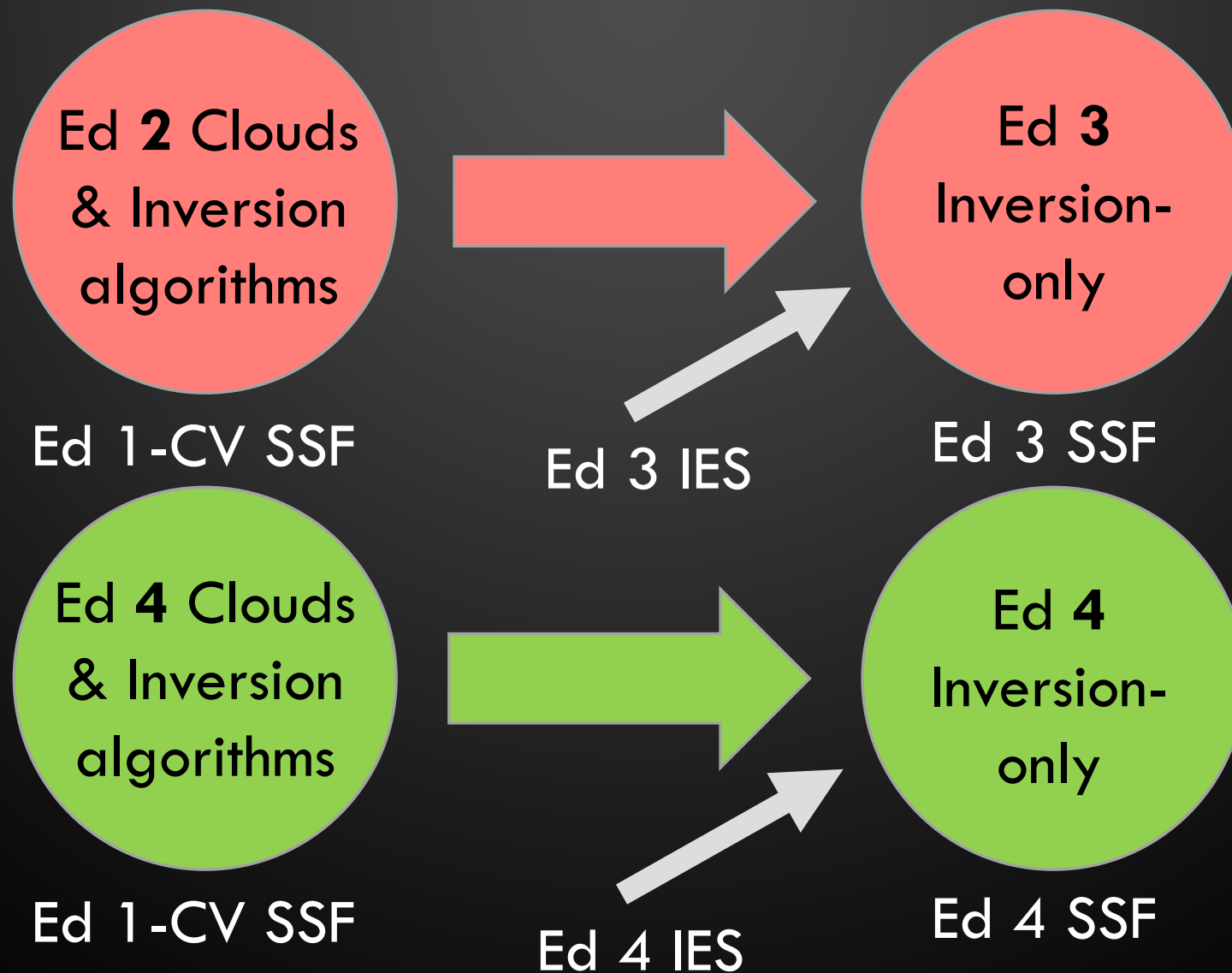
CATALYST PGE support, MODIS C6.0 support, PR creation, add Ed4 Inversion to Ed1-CV SSF stream

# DEPRECATION OF EDITION 3 PGES

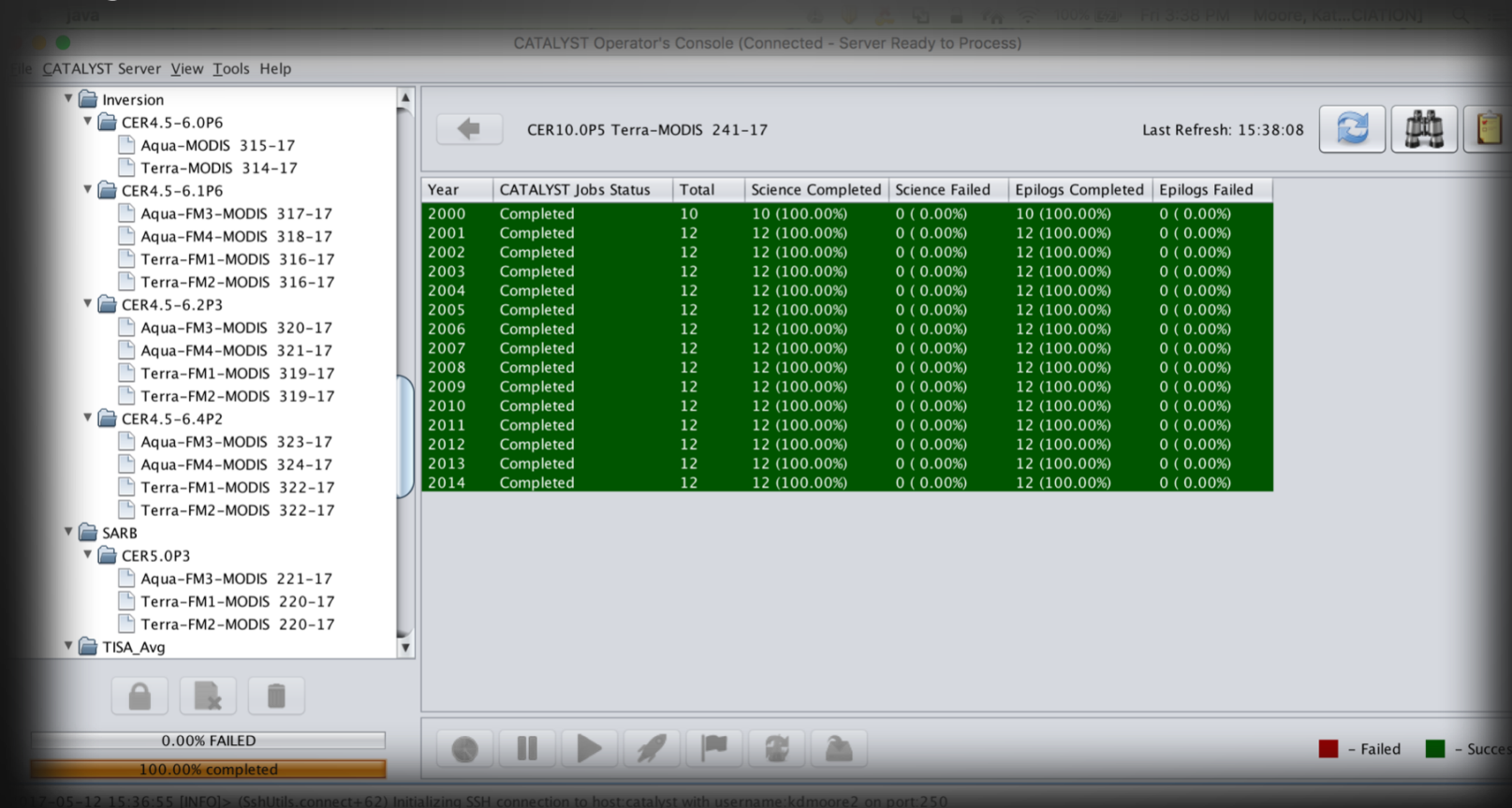
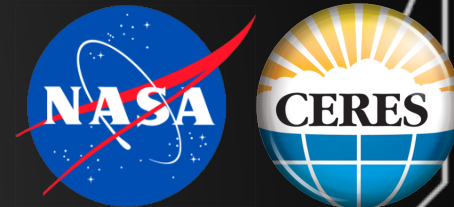
- Completed in June 2017 (data-date 3/31/17)
- MODIS Collection 5 To 6 – February 2017 overlap
- ...to 6.1



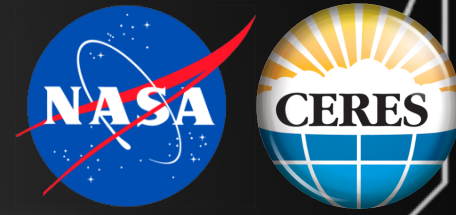
# DEPRECATION OF EDITION 3 PGE'S



# CATALYST

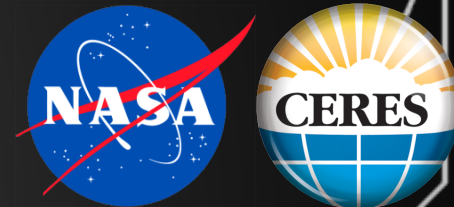


- Deployed Version 2.2
- 100% CERES PGE code logic delivered to CATALYST



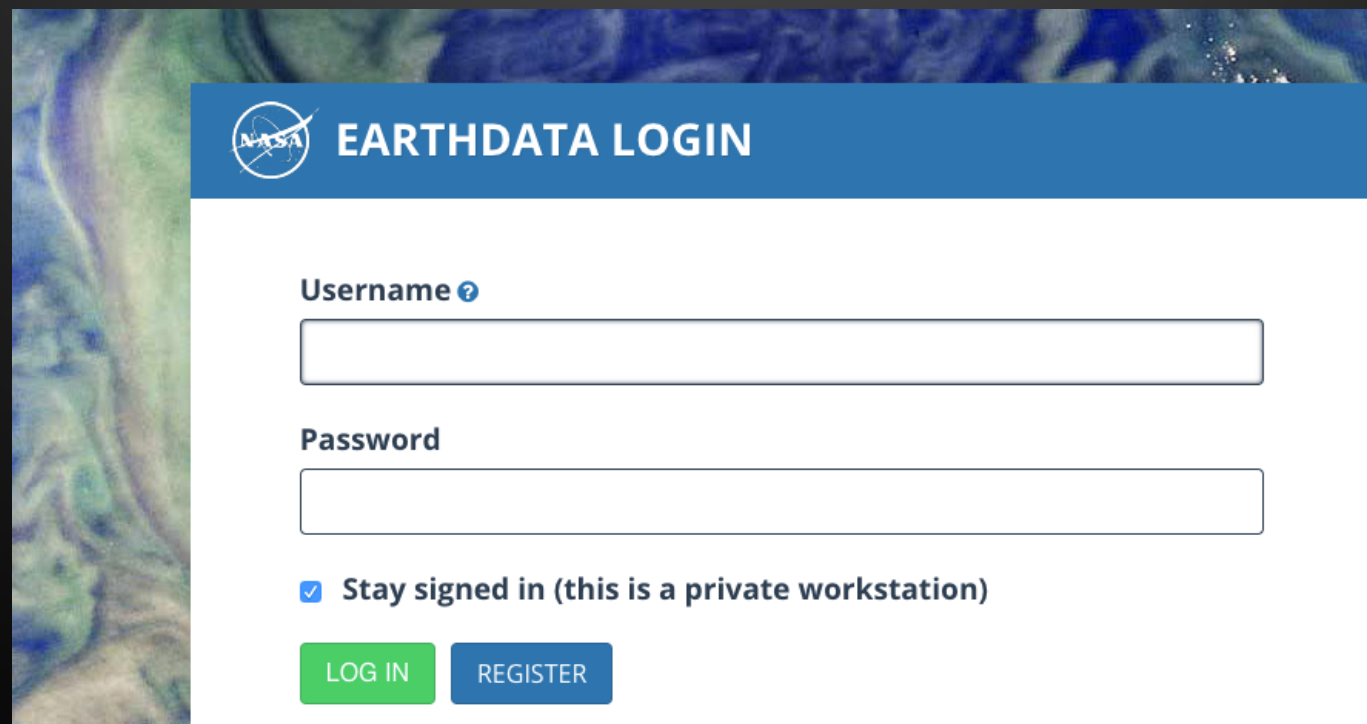
# ORDERING TOOL


- CERES DMT leading technical maintenance
- Currently assessing:
  - Hardware and software requirements
  - Migration to cloud (coordinating with ASDC)




# ORDERING TOOL

- Earthdata Login:
  - Becoming ubiquitous among EOSDIS systems
  - Integrated in test version of ordering tool

A screenshot of the Earthdata Login web page. The page has a blue header with the NASA logo and the text "EARTHDATA LOGIN". Below the header, there are two input fields: "Username" with a help icon and "Password". Below these fields is a checkbox labeled "Stay signed in (this is a private workstation)" which is checked. At the bottom, there are two buttons: "LOG IN" in green and "REGISTER" in blue. The background of the page shows a satellite image of Earth's surface.

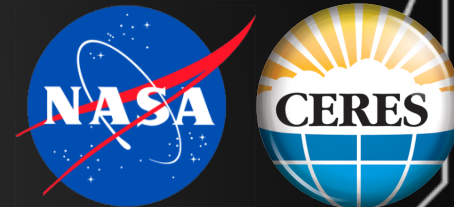
 **EARTHDATA LOGIN**

**Username** 

**Password**

☒ **Stay signed in (this is a private workstation)**

**LOG IN** **REGISTER**

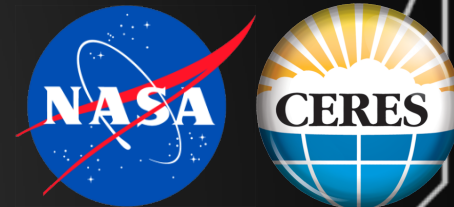


# ORDERING TOOL

- Earthdata Login:
  - Easier to track users (no “fake” users)
  - Roll-out in the next few months

**PUBLIC ORDERING TOOL FULLY FUNCTIONAL!**

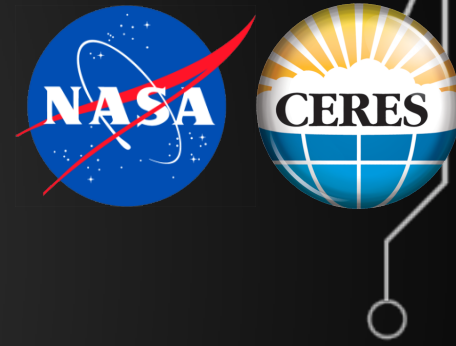
<https://ceres-tool.larc.nasa.gov/ord-tool/>



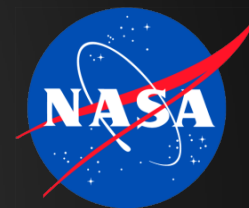
# SOFTWARE RELEASE

- Beginning process of Open Source Software Release
  - Ed 4 Terra/Aqua code
  - Software assurance

It's **NASA Policy!**



# PRODUCT AVAILABILITY



## EDITION 4 TERRA AND AQUA:

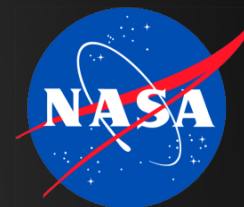
<u>Product</u>	<u>Platform</u>	<u>Processed Thru</u>	<u>Publically Available?</u>
BDS	Terra, Aqua	Mar. '17	Yes
SSF		Mar. '17	Yes
SSF1 deg-Hour		Feb. '17	Yes
SSF1 deg-Day/-Month		Feb. '17	Yes
SYN1 deg-Hour/3Hour/MHour	Terra+Aqua	Jan. '17	Yes
SYN1 deg-Day/-Month		Jan. '17	Yes



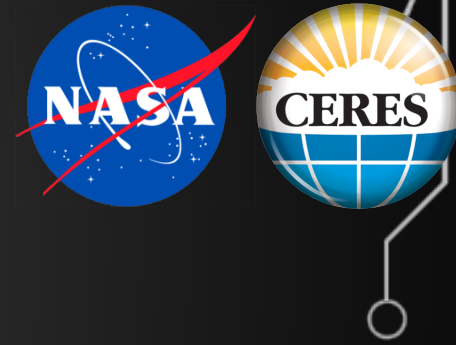
## EDITION 4 TERRA AND AQUA (CONT.):

<u>Product</u>	<u>Platform</u>	<u>Processed Thru</u>	<u>Publically Available?</u>
CldTypHist	Terra+Aqua	Jan. '17	Yes
FluxByCldTyp	Terra, Aqua		Will be
EBAF Surface	Terra+Aqua	Aug. '16	Yes
EBAF ToA	Terra+Aqua	Jan. '17	Yes

# EDITION 1 S-NPP:



<u>Product</u>	<u>Platform</u>	<u>Processed Thru</u>	<u>Publically Available?</u>
BDS	S-NPP	Jul. '17	Yes
SSF		Mar. '17	Yes
SSF1 deg-Hour		Feb. '17	Yes
SSF1 deg-Day/-Month		Feb. '17	Yes
SYN1 deg	Terra+S-NPP	Dec. '13	Will be



## RECENT PUBLIC RELEASES

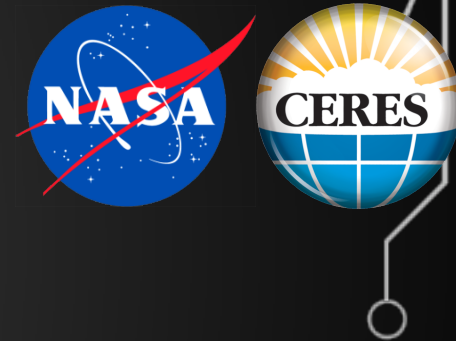
- Ed 4 Terra & Aqua

- EBAF Surface – Released June 16, 2017
- SYN1deg
- ES8

- Ed 1 S-NPP

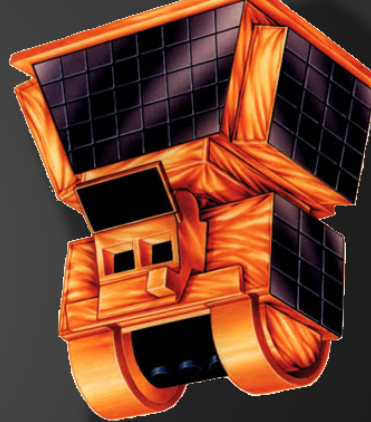
- ES8

} Released September 13, 2017



FM6

FM6



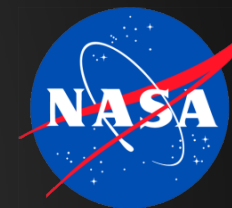
- CERES FM6 installed on JPSS-1 satellite
- Instead of window channel – extra longwave
- FM6 ORR on October 4, 2017



11/10!

LAST OF  
DELTA-II  
ROCKETS

FM6

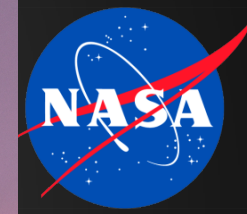


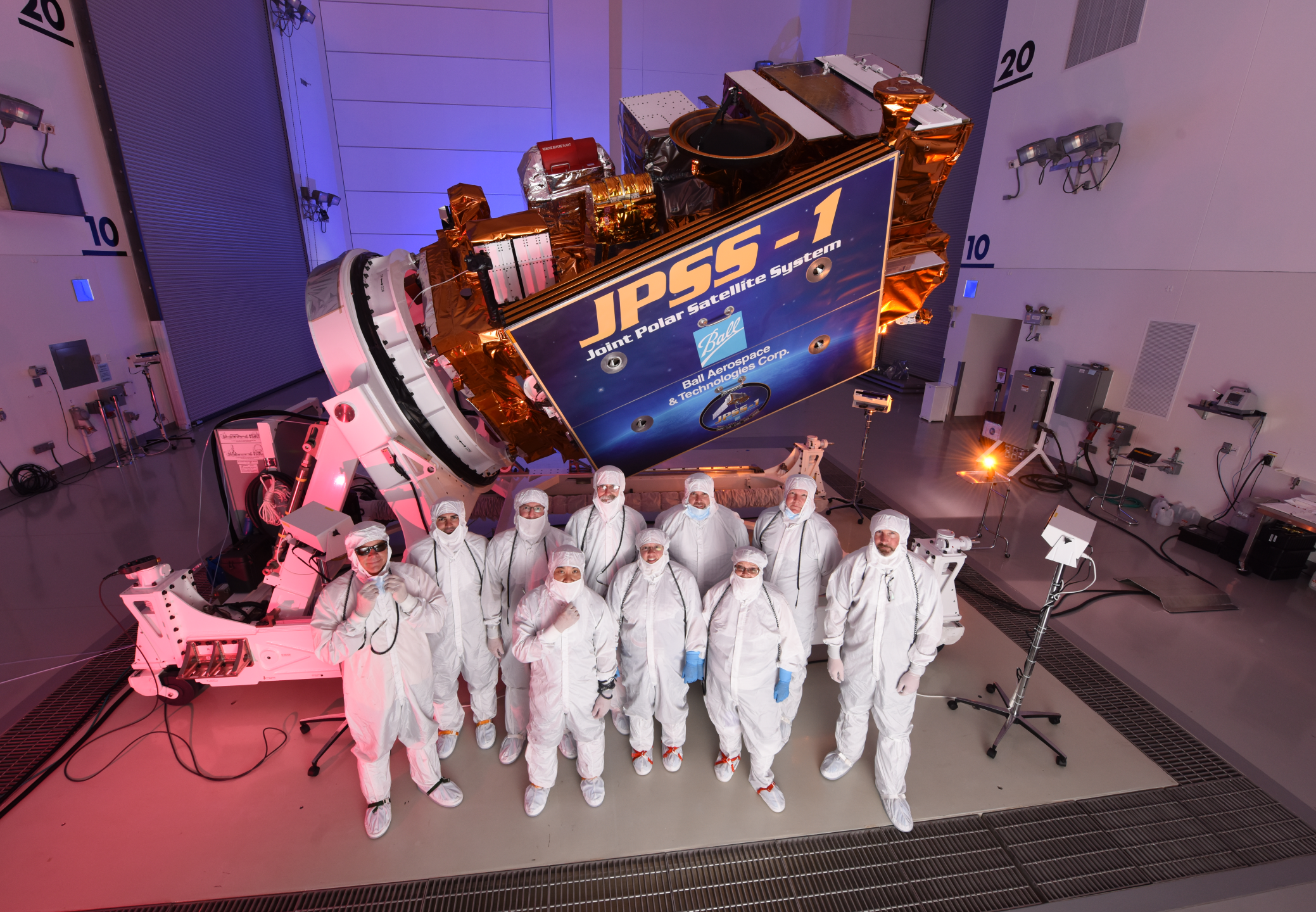
- Completed all pre-flight data flow testing
- Supported 3 JPSS-1 GST BLK2.0 tests
  - Used JCT4/-5 test data and ran offline
  - Ran autonomous stream successfully
- At-launch, daily, BDS and ES8 products

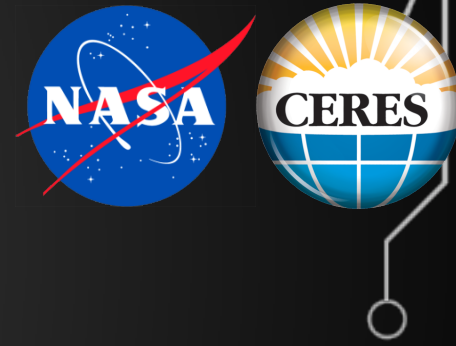
11/10!

LAST OF  
DELTA-II  
ROCKETS

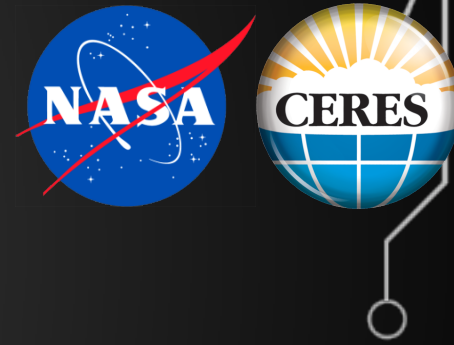








# SYSTEMS & CM



# SYSTEMS – PLATFORM MIGRATION

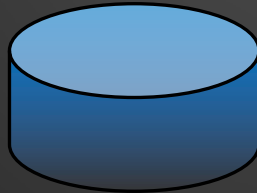
- Powerchip to x86 architecture migration, some PGEs require Powerchips (7 outstanding to migrate)
- Will have Powerchips ~half-year more
- StorNext/DPO to unified IBM HPSS storage migration

# SYSTEMS – DATA PLAN

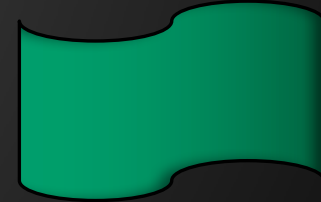


## CERES/ASDC Data Policy Plan

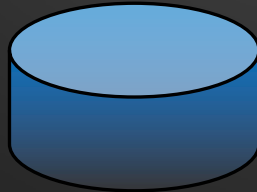
Current version:  
Low-latency



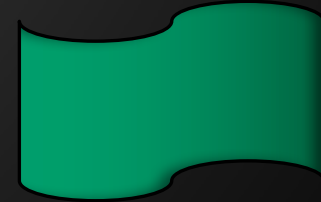
archive copy



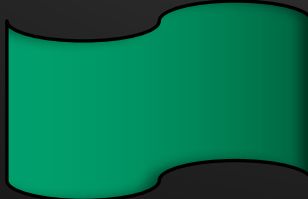
1-back version:  
Low-latency



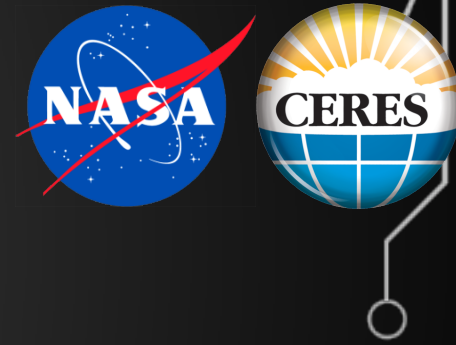
archive copy



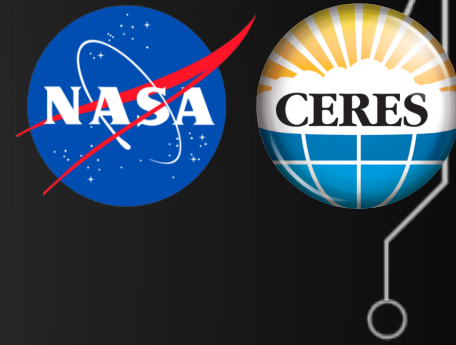
2-back version:  
High-latency



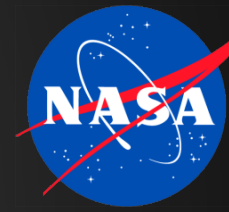
# CONCLUSIONS



- FluxByCldTyp delivery imminent
- CATALYST integration is finalizing
- Terra/Aqua Edition 5: distant future
- S-NPP Edition 2: near future



# TECHNICAL DEVELOPMENT



# TIMELINE

Stakeholder interviews

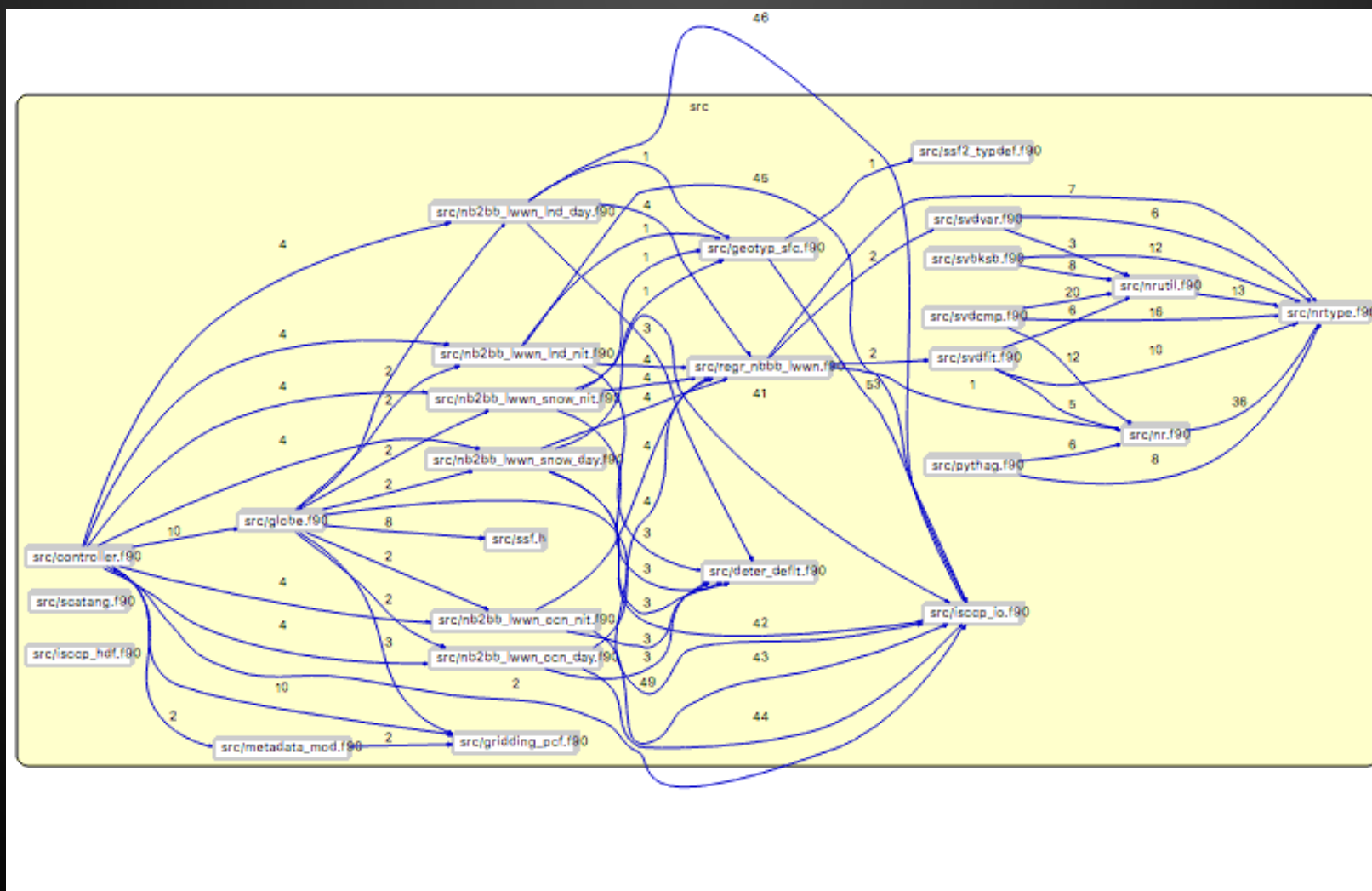
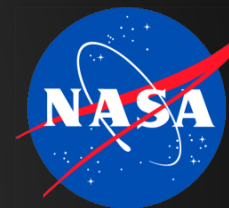
Git/Bitbucket training and code in Bitbucket

Code analysis

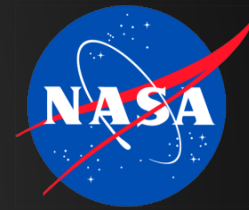


Image: <https://scitools.com/>

# CODE ANALYSIS



# CODE ANALYSIS



Understand - (Build 907) - CER7.3.1P2.udb - CodeCheck

Project Browser - CER7.3.1P2.udb

- controller.f90
- deter\_deflt.f90
- geotyp\_sfc.f90
- globe.f90
- gridding\_pcf.f90
- isccp\_hdf.f90
- isccp\_io.f90
- metadata\_mod.f90
- nb2bb\_lwwn\_ind\_day.f90
- nb2bb\_lwwn\_ind\_nit.f90

Files (33 of 2188 entities)

Show: Files

Filter:

- controller.f90
- deter\_deflt.f90
- geotyp\_sfc.f90
- globe.f90
- gridding\_pcf.f90

Information Browser

Main Program controller

Defined in: controller.f90

- Variables
- Uses
- Calls
- References by Flat List
- Metrics

114 (CountLine)

Last Analysis: 9/15/17 2:19 PM

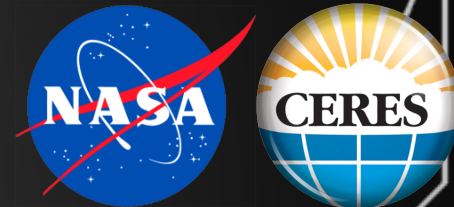
Getting Started Cluster : controller.f90 Arch Internal Dependencies : Directory Structure CodeCheck

Files Checks Result Log Results by File Results by Check Result Locator Result Treemap Ignores List Inspect

Results by Check Expand All Collapse All ☒ Show Violation ☐ Show Ignored ☐ Flatten Files L

Results	Entity
39	Number of Results: 39
39	SciTools' Recommended Checks
14	Files too long - RECOMMENDED_02
9	Functions Too Long - RECOMMENDED_04
16	Overly Complex Functions - RECOMMENDED_10

Reconfigure Result Log Results by File Result Locator Result Treemap



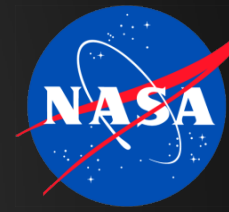
# VERSION CONTROL

- “Git on Board!” workshop, offered June 28, 2017
  - Local repositories
  - Remote repositories
  - Add-commit-push
- “Git Smart!” follow-up workshop, offered August 16, 2017
  - Branching
  - Merging
  - Remote collaboration

# VERSION CONTROL



**ALL** CERES PGE production code is now in  
local and remote version control.



## NEXT STEPS

